

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of)	
)	GN Docket No. 09-191
Preserving the Open Internet)	
)	WC Docket No. 07-52
Broadband Industry Practices)	

REPLY COMMENTS OF ROOT WIRELESS, INC.

Pursuant to the Notice of Proposed Rulemaking released by the Commission on October 22, 2009, Root Wireless, Inc. (“Root Wireless” or “Root”) hereby submits its reply comments.

DISCUSSION

These comments are submitted for the purpose of addressing one particular issue – the application of the transparency principle to mobile wireless carriers.

We start from the premise that what truly matters is the service that is actually experienced by the end user. Considerations of whether, what, and how to regulate should be based on that maximizing that end user experience.

In order to assess the end user experience, transparency into the network is critical. With transparency into the operations of the network access providers, network customers should be able to judge for themselves whether they are satisfied with what they are receiving, which should indicate that the market is working. Without transparency, however, customers have no way of knowing whether they are receiving what they have been promised.

We note that our comments are intended to relate specifically to mobile wireless networks. Some of the same considerations may also apply to fixed wireless systems, although

these comments are not prepared with those systems in mind. Therefore, all references to wireless systems should be understood to refer only to mobile networks.

I. Protecting Consumer Choice

The first three of the principles that are set forth in the proposed rule all are premised on preserving “choice” for Internet users. In order for choice to be meaningful, however, it must be made on an informed basis. Root Wireless urges the Commission to adopt the approach that, first and foremost, relies on and enables the market to provide consumers with access to the information that will put them in a position to make their own informed decisions.

Some commenters have argued that the Commission need not do anything more or differently than is currently being done. *See, e.g.*, Comments of CTIA – The Wireless Association. Others have argued that the Commission should impose fairly detailed performance and disclosure requirements on wireless carriers. *See, e.g.*, Comments of New America Foundation, Columbia Telecommunications Corporation, Consumers Union, Media Access Project, and Public Knowledge. We would submit that, particularly in light of the complexities associated with wireless networks, the best course lies somewhere in between.

II. Assessing the Consumer’s Experience

A. Network Capabilities

There are a number of factors that will determine the performance that will be experienced by an end user starting, of course, with the network itself. But the capabilities of the network will not remain static; instead, they will evolve with all of the changes that the network operator makes to the network, from minor retunes to the implementation of entire new generations of technology. While we do not offer any specific recommendations in this regard, Root Wireless supports requiring a basic level of disclosure regarding network capabilities and

of sufficient information regarding network management practices so that users will know what they should *expect*.

We will leave to others the discussion of whether and to what extent the carriers should be told the level of service that they must provide. Regardless of the outcome of that question, we believe it is even more important that end users be told the level of service that they should *expect* to receive and that the information they are given be more precise than is currently the case in defining both the quality of service and the areas within which that service is available. End users can then judge for themselves whether they are receiving what they have been promised or if they should turn to the market for an alternative.

B. Other Factors Affecting the End User's Experience

Assessing the performance that is experienced by a consumer only begins with an understanding of the network. That experience also will be impacted substantially by numerous factors that exist outside the network and beyond the carrier's control. The following is not intended to be an exhaustive list of these factors, but merely to illustrate some of the more significant ones.

- 1) For starters, many different types of devices are capable of using wireless networks to access the Internet, and different devices provide dramatically different performance levels. Mobile phones, smartphones, netbooks, laptop computers and a host of other devices vary dramatically with respect to much of their operating functionality –sheer power differences, communication protocols, the manner in which applications are written for different devices, the size of data packet files specified by those applications (which tend to be much smaller for truly mobile devices), and many others. For example, due to the combination of these factors, an optimally configured laptop computer

typically will communicate via a wireless network at a throughput rate that is several times faster than a smartphone operating next to it. This difference does not reflect a weakness in the network; it simply reflects the fact that devices matter because different devices will perform at different levels.

- 2) Without dwelling on it here since this is well-known and already has been addressed by others in this proceeding and many others, environmental factors, such as the presence of natural and man-made obstructions, can have a substantial impact. The details about network performance mean little if the user can't obtain a signal.
- 3) As is equally well-known, with all current mobile wireless technologies performance is inversely related to the number of users attempting to operate in the same general vicinity. With the first few users, the effect is relatively slight, but as the number of users increases the effect becomes more and more pronounced, until at some point a user is simply unable to establish or maintain a network connection. Variations in the number of users in a particular area often (but not always) follow a fairly predictable pattern that corresponds to the time of day or day of the week. For example, traffic loads are likely to be high on commuter routes during rush hours on weekdays, but much lighter at other times. Even some of the exceptions may not follow a routine pattern but nevertheless are predictable, since they may correspond to special events.
- 4) Most wireless carriers, and all of the national carriers, now operate multiple networks, comprised of different generations of wireless technology and sometimes even fundamentally different technologies. Even now carriers operate multiple generations of service that each provides "broadband" service, at least according to some of the definitions that are in use. Since consumers will be using devices utilizing each of these

different networks, consumers are likely to be interested in knowing the performance characteristics of the network on which they are relying and not simply the “latest and greatest”.

C. Measuring Consumer Experience

Given the number and variety of factors affecting the end user’s experience, what are the metrics by which performance can be measured? In the early days of cellular phones, network quality was primarily a matter of coverage - the presence and strength of a radio signal. As penetration rates increased, network congestion began to appear in some areas, so capacity, as reflected by indicators such as failed and dropped calls, emerged as an issue separate and apart from mere coverage. The introduction of data services brought a new set of issues for consumers, who now also became interested in throughput speed and other measures of technical proficiency.

4G services like LTE and WiMax will make completely new types of services, such as streaming video, available to mobile users. With those services is likely to come a need for new operating metrics, such as jitter and latency. By converting voice communications to data signals, these technologies may also enable – and create a demand for – new measures of voice quality that correspond to packet voice service. Who knows what metrics will accompany even more advanced technologies?

Until recently, consumers have not had access to objective measurements of network performance. Now, however, that is changing. Root Wireless and others can now provide near real-time assessments of device-specific performance in an objective and comprehensive manner. As a result, we agree with the wireless access providers that the market is capable of providing to consumers the information with which they can make informed decisions about

network performance. However, this ability is predicated on the carriers permitting sufficient transparency that this information will continue to be available, as will be addressed in greater detail below.

D. Combining the Elements

When all of the foregoing elements are considered together, Root Wireless expects that consumers will want to know – in terms of availability of service, speed, and whatever other measures of service quality consumers determine are of most use to them - what they can expect of 1) various devices, 2) operating on any given carrier, 3) utilizing any given technology, 4) in multiple locations, 5) at any given time or day. Needless to say, that is an enormous number of combinations of data that consumers will demand. And it will change constantly as new devices are introduced, new wireless technologies are deployed, and new service providers emerge.

III. Recommendations

A. Some Mandatory Disclosure by the Network Providers is of Value

Given the context in which these issues arise, we do not agree with those who find great value in requiring detailed disclosure by wireless carriers regarding performance metrics. The sheer complexity of the situation dictates that the market will be best-suited for developing the solutions that fulfill consumers' needs. Moreover, given the changes that routinely will be occurring in the wireless ecosystem, any regulatory solution would constantly be in the position of playing catch-up.

That is not to say that a certain level of disclosure is not warranted. To the extent that information about the network capabilities is helpful, we support requiring disclosure of that information, although we would caution that consumers need to be educated that, for reasons going well beyond those with which many consumers may have become familiar related to their

landline service, their own experience may not correlate to the network capabilities. Disclosures in this area have the potential for being misleading unless fully explained, so disclosure simply for the sake of disclosure will not necessarily advance consumers' interests. For example, while a network might be capable of producing download speeds of up to a particular number of megabits per second, a consumer using a dated device or even one using the most current device but at the busiest time is very unlikely to be able to experience anything close to that, demonstrating how disclosures could become useless to the point of being misleading. At the same time, since most network operators do not yet allow open access for all devices, requiring greater disclosure in other areas, such as the specifications that must be met for certification of a device for use on a particular network, may also contribute to the ultimate goal of improving the consumer's experience.

Such disclosures about the network should be distinguished from measurements of end user experience. When it comes to assessing the end user experience, as opposed to the network's capabilities, not only should this obligation not be imposed on the carriers in the form of mandatory disclosures, it would be inappropriate to do so. Of course, the carriers should be free to offer this information if they choose to do so, but this is a measurement *of* performance, not a disclosure *about* capabilities. The carriers should not be asked to perform a self-evaluation. Instead, that role should be left to third parties who can act independently from the carriers.

B. Ensuring the Ability to Measure Network Performance

In order for third parties to be able to measure consumers' experience with the wireless networks, the network providers must not interfere with the measurement process. To that end, Root Wireless offers the following recommendations:

1. We take no position as to what network management practices are and are not reasonable. To the extent such practices are left to the carriers' discretion, however, carriers should be required to disclose clearly to the consumer the effect that such practices will have in order that the actual service level can be measured against the service levels promised by the provider.
2. Access providers should be prohibited from taking steps that would interfere with network measurement techniques that are no more burdensome on the network than typical end user traffic. For example, carriers should be prohibited from blocking access to APIs that 1) would allow consumers to measure any performance standard that is claimed by the carrier or 2) any other standards that a consumer reasonably should expect to be able to measure. It should be made clear that such practices never constitute reasonable network management.

CONCLUSION

Root Wireless appreciates the enormity of the challenge before the Commission as it considers how to preserve the openness and vitality of the Internet. We urge the Commission to proceed cautiously in these efforts and to look to the market to the greatest extent possible as the best means to achieve these goals. At least most of the wireless carriers similarly have espoused the view that the market should not be disrupted. When it comes to providing consumers with the information they need in order to make informed choices about the provider of their wireless service, we generally agree that the market will be able to provide this information, and therefore detailed disclosure requirements are not needed, so long as the carriers maintain sufficient transparency about their practices and into their networks that the markets in fact are able to operate.

Respectfully submitted,

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